WE CLAIM:

1. A composition of matter represented by the general formula

$$Ln_xLn'_{x'}A_yTi_zCe_{1-x-x'-y-z}O_{2-\delta}$$

wherein Ln is selected from the group consisting of Sm, Gd and Y; Ln' is selected from the group consisting of La, Pr, Nd, Pm, Eu, Tb, Dy, Ho, Er, Tm, Yb and Lu; A is selected from the group consisting of Mg, Ca, Sr and Ba, $0.05 \leq x \leq 0.25$, $0 \leq x' \leq 0.25$, $0 \leq y \leq 0.03$, $0.001 \leq z \leq 0.03$, $0.05 \leq x + x' \leq 0.25$ $0.001 \leq y + z \leq 0.03$, wherein δ is a number which renders the composition of matter charge neutral.

2. The composition of matter of claim 1 wherein Ln is Sm.

3. The composition of matter of claim 1 wherein A is Mg.

4. The composition of matter of claim 1 wherein $0.1 \leq x \leq 0.2$.

5. The composition of matter of claim 1 wherein $y = 0$.

6. The composition of matter of claim 1 wherein $x' = 0$.

7. A. composition of matter represented by the general formula $Ln_xTi_zCe_{1-x-z}O_{2-\delta}$ wherein Ln is selected from the group consisting of Sm, Gd and Y, $0.05 \leq x \leq 0.25$, $0.0025 \leq z \leq 0.02$ and δ is a number which renders the composition of matter charge neutral.

8. The composition of matter of claim 7 wherein Ln is Sm.

9. The composition of matter of claim 7 wherein Ln is Gd.

10. The composition of matter of claim 7 wherein Ln is Y.

11. A method of manufacturing a solid electrolyte comprising a composition of matter having a density greater than 95% theoretical density represented by the general formula

$$Ln_xLn'_{x'}A_yTi_zCe_{1-x-x'-y-z}O_{2-\delta}$$

wherein Ln is selected from the group consisting of Sm, Gd, Y, and mixtures thereof; Ln' is selected from the group consisting of La, Pr, Nd, Pm, Eu, Tb, Dy, Ho, Er, Tm, Yb and Lu; A is selected from the group consisting of Mg, Ca, Sr and Ba, $0.05 \leq x \leq 0.25$, $0 \leq x' \leq 0.25$, $0 \leq y \leq 0.03$, $0.001 \leq z \leq 0.03$, $0.05 \leq x + x' \leq 0.25$, $0.001 \leq y + z \leq 0.03$, wherein δ is a number which renders the composition of matter charge neutral, said method comprising the steps of.

(a) forming a mixture by mixing metal-containing materials corresponding to the metals in the composition of matter to establish the stoichiometric coefficients of the metals of the composition of matter;

(b) forming the mixture into a desired shape for the solid electrolyte; and

(c) sintering the desired shape at a temperature of less than or equal to1600 °C to form the solid electroltye having a density greater than 95% theoretical density.

12. The method of claim 11 wherein the metal-containing materials are metallic oxides.

13. The method of claim 12 wherein the metallic oxides have an average particle size of less than 5 μm.

14. The method of claim 11 wherein mixing is effected by a technique selected from the group consisting of attrition milling, vibratory milling, ball milling and high shear mixing.

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